"great" herring, after being so extremely abundant, for about sixty years, as to give rise to a great industry, disappeared in the year 1808, as suddenly as they made their appearance, and have not since been seen in any number.

The desertion of their ordinary grounds by the herring has been attributed to all imaginable causes, from fishing on a Sunday to the offence caused to the fish by the decomposing carcases of their brethren, dropped upon the bottom out of the nets. The truth is that absolutely nothing is known on the subject; and that little is likely to be known, until careful and long-continued meteorological and zoological observations have furnished definite information respecting the changes which take place in the temperature of the sea, and the distribution of the pelagic crustacea which constitute the chief food of the herring shoals. The institution of systematic observations of this kind is an object of international importance, towards the attainment of which the British, Scandinavian, Dutch, and French Governments might wisely make a combined effort.

A great fuss has been made about trawlers working over the spawning grounds of the herring. "It stands to reason," we were told, that they must destroy an immense quantity of the spawn Indeed this looked so reasonable, that we inquired very particularly into a case of the alleged malpractice which was complained of on the east coast of Scotland, near Pittenweem. Off this place, there is a famous spawning ground known as the Traith hole, and we were told that the trawlers worked vigorously over the spot immediately after the herring had deposited their spawn. Of course our first proceeding was to ask the trawlers why they took the trouble of doing what looked like wanton mischief. And their answer was reasonable enough. It was to catch the prodigious abundance of flat-fish which were to be found on the Traith at that time. Well, then, why did the flat-fish congregate there? Simply to feed on herring eggs, which seem to be a sort of flat-fishes' caviare. The stomachs of the flat-fish brought up by the trawl were, in fact, crammed with masses of herring eggs.

Thus every flat-fish caught by the trawl was an energetic destroyer of herring arrested in his career. And the trawling, instead of injuring the herring, captured and removed hosts of their worst enemies. That is how "it stood to reason" when one got to the bottom of the matter.

I do not think that any one who looks carefully into the subject will arrive at any other conclusion than that reached by my colleagues and myself: namely, that the best thing for Governments to do in relation to the herring fisheries, is to let them alone, except in so far as the police of the sea is concerned. With this proviso, let people fish how they like, as they like, and when they like. At present, I must repeat the conviction we expressed so many years ago, that there is not a particle of evidence that anything man does has an appreciable influence on the stock of herrings. It will be time to meddle, when any satisfactory evidence that mischief is being done is produced

NOTES

THE fifty-first Annual Meeting of the British Association for the Advancement of Science will commence at York on Wednesday, August 31, 1881. The President-Elect is Sir John Lubbock, Bart, M.P., F.R.S. Vice-Presidents Elect: His Grace the Archbishop of York, D.D., F.R.S.; the Right Hon. the Lord Mayor of York; the Right Hon. Lord Houghton, F.R.S.; the Ven. Archdeacon Creyke, M.A.; the Hon. Sir W. R. Grove, F.R.S.; Prof. G. G. Stokes, Sec. R.S.; Sir John Hawkshaw, C.E., F.R.S.; Allen Thomson, M.D., F.R.S. L. and E.; Prof. Allman, M.D., F.R.S. L. and E. General Secretaries: Capt. Douglas Galton, C.B., D.C.L., F.R.S.; Philip Lutley Sclater, Ph.D., F.R.S. Acting Secretary: George Griffith, M.A., F.C.S., Harrow; General Treasurer: Prof. A. W. Williamson, F.R.S., University College, London, W.C. Local Secretaries: Rev. Thomas Adams, M.A.; Tempest Anderson, M.D., B.Sc., York. Local Treasurer: W. W. Wilberforce, York. The Sections are the following:—A.—Mathematical and Physical Science.—President: Prof. Sir William Thomson, F.R.S. L. and E. Vice-Presidents.—Prof. J. C. Adams, F.R.S.; T. Archer Hirst, Ph.D., V.P.R.S. Secretaries: Prof. W. E. Ayrton; Oliver J. Lodge, D.Sc.; Donald McAlister, B.A., B.Sc. (Recorder). B.—Chemical Science.—President: Prof. A. W. Williamson, For. Sec. R.S., V.P.C.S. Vice-Presidents: F. A. Abel, C.B., F.R.S.; Prof. Odling, F.R.S. Secretaries: Harold B. Dixon, M.A.; P. Phillips-Bedson, D.Sc. (Recorder). C.—Geology.—President: Andrew Crombie Ramsay, LL.D., F.R.S., Director-General of the Geological Survey of the United Kingdom and of the Museum of Practical Geology. Vice-Presidents: Prof. Prestwich, F.R.S.; Prof. W. C. Williamson, F.R.S.; Secretaries: W. Topley, F.G.S. (Recorder); W. Whitaker, F.G.S. D.—Biology.—President: Richard Owen, C.B., F.R.S. Vice-Presidents: Prof. W. H. Flower, F.R.S.; Prof. J. S. Burdon Sanderson, F.R.S. Secretaries: G. W. Bloxam, M.A., F.L.S.; W. L. Distant; W. A. Forbes, F.Z.S.; Prof. M'Nab, M.D.; John Priestley; Howard Saunders, F.L.S., F.Z.S. Department of Zoology and Botany.—Richard Owen, C.B., F.R.S. (President), will preside. Secretaries: Prof. M'Nab, M.D. (Recorder); Howard Saunders, F.L.S., F.Z.S. Department of Anthropology.—Prof. W. H. Flower, F.R.S. (Vice-President), will preside. Secretaries: G. W. Bloxam, M.A., F.L.S. (Recorder); W. L. Distant. Department of Anatomy and Physiology.—Prof. J. S. Burdon Sanderson, F.R.S. (Vice-President), will preside. Secretaries: John Priestley (Recorder); W. A. Forbes, F.Z.S. E.—Geography.—President: Sir J. D. Hooker, K.C.S.I., C.B., F.R.S. Vice-Presidents: Francis Galton, F.R.S.; Prof. Sir C. Wyville Thomson, F.R.S. L. & E. Secretaries: H. W. Bates, Assist.-Sec.R.G.S., F.L.S.; E. C. Rye, Librarian R.G.S., F.Z.S. (Recorder). F.—Economic Science and Statistics.—President: The Right Hon. M. E. Grant Duff, M.P., F.R.S. Vice-Presidents: Sir George Campbell, K.C.S.I., M.P.; James Heywood, F.R.S. Secretaries: Constantine Molloy (Recorder); J. F. Moss. G.—Mechanical Science.—President: Sir W. G. Armstrong, C.B., F.R.S. Vice Presidents: W. H. Barlow, F.R.S., Pres.Inst.C.E.; C. W. Siemens, D.C.L., F.R.S. Secretaries: A. T. Atchison, M.A. (Recorder); H. Trueman Wood, B.A. Tickets for the meeting may be obtained of the Local Secretaries at York, and at the Office of the Association, 22, Albemarle Street, London, W.; or on application by letter, from August 17 to August 24, to the General Treasurer, Prof. A. W. Williamson, British Association, University College, London, W.C. The First General Meeting will be held on Wednesday, August 31, at 8 p.m. precisely, when A. C. Ramsay, F.R.S., V.P.G.S., Director-General of the Geological Survey of the United Kingdom, and of the Museum of Practical Geology, will resign the chair, and Sir John Lubbock, Bart., M.P., F.R.S., President-Elect, will assume the presidency, and deliver an address. On Thursday evening, September 1, at 8 p.m., a *soirée;* on Friday evening, September 2, at 8.30 p.m., a discourse by T. H. Huxley, LL.D., Sec.R.S., Professor of Natural History in the Royal School of Mines; on Monday evening, September 5, at 8.30 p.m., a discourse by W. Spottiswoode, D.C.L., LL.D., President of the Royal Society; on Tuesday evening, September 6, at 8 p.m., a *soirée;* on Wednesday, September 7, the concluding general meeting will be held at 2.30 p.m. No report, paper, or abstract, can be inserted in the Report of the Association unless it is given in before the conclusion of the meeting. Excursions to places of interest in the neighbourhood of York will be made on the afternoon of Saturday, September 3, and on Thursday, September 8.

THE honorary degree of LL.D. has been conferred on the following gentlemen by the University of Glasgow:—F. M. Balfour, M.A., Fellow of Trinity College, Cambridge; Dr. Angus Smith, F.R.S., Government Inspector of Alkali Works; Prof. Richard Owen, C.B., F.R.S., Superintendent of Natural History Collections of the British Museum; Andrew Buchanan, M.D., Emeritus Professor of Physiology in the University of Glasgow.

THE honorary degree of LL.D. has been conferred by the University of Edinburgh on Prof. A. W. Williamson, of University College, London.

IT is intended to celebrate in Edinburgh the centenary of the birthday of Sir David Brewster, on December 9, by a public dinner.

THE annual meeting of the Iron and Steel Institute will be held in London on May 4, 5, and 6. On May 4 the Bessemer Medal for 1881 will be presented to Mr. William Menelaus, and the president-elect (Mr. Josiah T. Smith) will deliver his inaugural address. The following is the list of papers to be read:—On the Results of Experiments relative to Corrosion in Iron and Steel, by Mr. William Parker of Lloyd's Registry, London; On the Manufacture of Armour Plates, by Mr. Alexander Wilson, Sheffield; On the Manufacture of Steel and Steel Plates in Russia, by Mr. Sergius Kern, St. Petersburg; On the Use of Steel for Shipbuilding, by Mr. William Denny, Dumbarton; On some Physical Properties of Cast Iron, by Mr. Charles Markham, Staveley; On the Desulphurisation of Iron, by M. Rollet, St. Chamond, France; On Iron and Steel Permanent Way, by Mr. R. Price Williams, London; On Hydraulic Appliances for the Bessemer Process, by Mr. Michael Scott, London; On the Manufacture of Bessemer Steel and Steel Rails in America, by Capt. Jones, Edgar Thomson Steel Works, Pittsburg, U.S.A.; On Hydrogen and Carbonic Oxide in Iron and Steel, by Mr. John Parry, Ebbw Vale; On the Preservation of Iron and Steel Surfaces, by Mr. George Bower, St. Neots; On a new method for the determination of Oxygen in Iron and Steel, by Mr. Alex. E. Tucker, Rhymney.

DURING the Summer Term of the City and Guilds of London Institute, commencing May 2, 1881, Prof. Armstrong, Ph.D., F.R.S., and Prof. Ayrton, A.M., Inst.C.E., will continue their tutorial and laboratory courses of instruction in chemistry and physics as applied to the arts and manufactures, at the Cowper Street Schools, pending the present erection of the City and Guilds of London Technical College, Finsbury, the foundation stone of which will be laid by Prince Leopold on May 10. There are both day and evening classes at the institute, with means for ample laboratory practice, at fees which place the education within reach of all classes. We would specially draw attention to the fact that these classes and the laboratory practice are open, at an almost nominal fee, to female as well as to male students. For every hour of lecture there are two hours laboratory work included in this nominal fee. The day classes would be of service to girls who have not the means to obtain a Girton or a Newnham education, while the evening classes will be of great use to those women who take more than a mechanical interest in their daily work; for from the course of instruction and their own work in the laboratory they will gain such a thorough knowledge of principles as should distinguish a skilled workwoman from a mere machine.

THE Annual Report for the past year of the Jamaica Public Gardens, by Mr. D. Morris, the new director, is one of great interest. As the year has been the first under the new organisation, the chief work has naturally been of a departmental character, but from the details given, it is evident that important advances have been made in developing several industries which must have an important influence for good on the future of the island. From the variation in altitude of the different gardens under Mr. Morris's charge excellent opportunities are afforded for experimenting on various kinds of cultivation, and these he is evidently prepared to take full advantage of. Among the various cultures, concerning which interesting information is contained in the Report, are Cinchona, Liberian Coffee, Sugar Canes, Teak and Mahogany, Pine-Apples, Jalap, Cacao, Tobacco, India-Rubber, various spices, Oranges, Banana Fibre, &c. The best results may be looked for from Mr. Morris's vigorous and intelligent directorship.

WE have also a very satisfactory Report of work for the year ending March 31, 1880, from Mr. Duthie, superintendent of the Government Botanical Gardens at Saharanpor and Mussooree. As in Jamaica, experiments, some of them very successful, have been carried on in the rearing of various useful plants, including vegetable and medicinal plants. Much difficulty has been experienced by Mr. Duthie in training *Mallies* for work in the gardens, and he has some trials before him ere he is able to turn out a staff of properly-trained natives.

MR. M. G. MULHALL sends us the following curious note, which we give without comment:—"Although Shakespeare is supposed to have taken the idea of Hamlet from the Danish historian Saxo-Grammaticus, there are such points of resemblance with the Arabic chronicle of Nigiaristan, respecting Montasser, tenth Caliph of Bagdad, that I venture to call your attention to the same. The points of analogy are as follows: 1. That Montasser is murdered by putting poison in his ear. 2. The ghost scene, in which his father appears to him. 3. The displaying of tapestry before the Caliph and his court, in which the tapestry represents a tragedy identical with the late Caliph's murder."

THE *Daily News* New York correspondent telegraphs that the aldermen have passed, over the mayor's veto, the ordinance giving the Edison Electric Lighting Company permission to lay tubes in the streets. "The company will proceed immediately to introduce its new electric lamps in the offices in the business portion of the city around Wall Street. The construction of the lamp is simple. It consists of a small bulbous glass globe, four inches long, an inch and a half in diameter, with a carbon loop which becomes incandescent when the electric current passes through. Each lamp is of sixteen candle-power, with no perceptible variation in intensity. The light is turned on or off with a thumbscrew. Wires have already been put into forty buildings. The company will compete with the gas companies by charging the same rates. If the latter reduce, the Edison Company will also reduce, and are prepared to go lower than the gas companies can."

AT five o'clock on Saturday morning a strong shock of earthquake was felt at Paola in the province of Calabria. On the night of April 19 there was another severe shock of earthquake at Chios.

A NEW illustrated work on the Butterflies of Europe is, we understand, in active preparation by Dr. Lang, F.L.S. Its publication, in monthly parts, will be commenced very shortly by Messrs. Lovell, Reeve, and Co.

MRS. BURTON, the wife of the well-known Capt. R. Burton, our Consul at Trieste, is evidently doing a good work in that city in teaching the people kindness to animals. The lesson is evidently much needed, and judging from Mrs. Burton's speech at her last fête and distribution of prizes, her efforts are meeting with decided success. Of course all this costs money; possibly some of our readers may be inclined to help by sending a contribution to Mrs. Richard Burton, British Consulate, Trieste, Austria.

OWING to the outcry caused by the sale to a private person of the Katoomba Falls, in the Blue Mountains, the New South Wales Government, according to the *Colonies and India*, has set apart for public use large tracts of land round Dangar's Falls, near Armidale, the Great Falls in the same district, and Moona Falls, near Walcha, in imitation of the reserves or national parks in the United States of America.

A REMARKABLE frost is said to have occurred in Guatemala on February 10, doing great damage to the tropical vegetation.

IN the review of Messrs. Fison and Howitt's "Kamilaroi and Kurnai" that appeared last week, we should have mentioned that the book is published in England by Messrs. Macmillan and Co.

FROM Glasgow we have received two satisfactory Reports—that of the Industrial Museum, presided over by Mr. James Paton, and that of the Mitchell Library, under Mr. F. T. Barrett.

TWO HUNDRED AND TEN school teachers nominated on purpose by the 30,000 public teachers of elementary schools in France, and travelling at the expense of the Government, were summoned to Paris in order to hold a Pedagogic Congress, which came to a close on the 24th. At the same time the Ligue de l'Enseignement, founded by M. Jean Macé, held a series of meetings at the Trocadéro. The concluding sitting, which took place last Thursday, was attended by all the school teachers and an immense number of political leaders. M. Gambetta delivered a speech praising the advantages of education, commending school teachers as a body, and advocating the importance of interesting ladies in the general diffusion of knowledge.

MESSRS. MARSHALL JAPP, AND CO., have published a useful little Half-Holiday Handbook of Geological Rambles around London, which will be found to add much interest to a Saturday afternoon walk into the country.

MR. H. L. JANSSEN VAN RAAY writes to us from Batavia, March 21, that in the enumeration of the different geographical societies of the world in NATURE, vol. xxiii. p. 299, the Geographical Society at Samarang (Java), founded in 1879, was omitted.

FIDELIS BUTSCH SOHN of Augsburg has issued a priced catalogue of the extensive library of the late Prof. W. P. Schimper of Strassburg.

THE new number of the *Proceedings* of the Bristol Natural History Society contains some good papers:—Some Optical Illusions, by Prof. S. P. Thompson; Underground Temperature, by Mr. E. Wethered; The Structure and Life-History of a Sponge, by Mr. W. G. Sollas; On some Cases of Prolification in *Cyclamen Persicum*, by Mr. A. Leipner; The Ethnology of the Paropamisus, by Dr. J. Beddoe, F.R.S.; Catalogue of the Lepidoptera of the Bristol District, by Mr. A. E. Hudd, and of the Fungi, by Mr. C. Bucknall; The Pomarine Skua, by M. H. Charbonnier.

THE additions to the Zoological Society's Gardens during the past week include three Short-tailed Wallabys (*Halmaturus brachyurus*) from West Australia, presented by Sir Harry St. George Ord, C.B., H.M.Z.S.; three Green Lizards (*Lacerta viridis*) from Jersey, presented by Mr. E. H. Bland; a Rufous Rat Kangaroo (*Hypsiprymnus rufescens*) from Australia, presented by Mr. A. W. Wyatt; a Lion (*Felis leo* ♀) from Africa, deposited; three Entellus Monkeys (*Semnopithecus entellus* ♂ ♂ ♀) from India, purchased; a Lion (*Felis leo* ♀) from Africa, a Common Otter (*Lutra vulgaris* ♀), British, received in exchange; a Collared Fruit Bat (*Cynonycteris collaris*), a Vulpine Phalanger (*Phalangista vulpina*), born in the Gardens.

CHEMICAL NOTES

IN *Journal pract. Chemie*, Herr Cech, in the course of a paper on the decompositions which occur during the rotting of eggs, describes experiments which he thinks establish the possibility of obtaining a good soap free from smell, by saponifying with soda the residue obtained by evaporating to dryness rotten eggs, freed from their shells. Such a dried residue yields about 10·5 per cent. of oil, fresh eggs giving about 11 per cent.

THE changes undergone by grain when stored in underground magazines have been recently studied by M. Müntz (*Compt. rend.*). The magazines of the Paris Omnibus Company are partly underground; the grain in the upper parts is, however, exposed to the influence of atmospheric changes; it is found to contain much more moisture and to be at a higher temperature than that in the lower parts. The relative amounts of deterioration in grains may be measured by the quantities of carbonic anhydride exhaled. When grain is freely exposed to air about ten times as much carbonic anhydride is given off as when the grain is kept in closed receptacles; less oxygen is absorbed than corresponds with this evolution of carbon dioxide. Normal grain contains from 11 to 19 per cent. of moisture: the greater the moisture the greater the exhalation of carbon dioxide. The amount of the gas evolved also increases with increase of temperature until a point is reached at which true chemical combustion of the carbon begins, as distinguished from the physiological combustion which has preceded it. Grain which is to be kept for any time ought to be very dry, the receptacle containing it ought to be completely closed, and all parts of this receptacle ought to be at approximately the same temperature.

MR. V. LEWES, in the same journal, describes barium pentathionate, $BaS_5O_6 . 3H_2O$, and several potassium pentathionates, prepared by slow evaporation in a vacuum of "Wackenroder's solution." These experiments appear to establish beyond doubt the existence of pentathionic acid.

DRS. DUPRÉ AND HAKE have applied their method for the estimation of carbon (*Chem. Soc. Journ.*)—viz. burning in oxygen, absorbing carbonic anhydride in baryta water, converting the barium carbonate into sulphate, and weighing as such—to the estimation of carbon in air; their experiments apparently demonstrate the presence in London air of carbon in forms other than carbonic anhydride, and probably in the form of some volatile organic compounds, not as suspended matter. Drs. Dupré and Hake claim that their method of analysis enables them to estimate carbonic anhydride, carbon in the peculiar forms already noticed, and suspended carbonaceous matter in air.

IN the same journal there is a contribution to the history of ozone by Prof. Hartley of Dublin. The main conclusions drawn from experimental data are these: Ozone is a normal constituent of the higher atmosphere, and is present therein in larger proportion than near the surface of the earth. The limitation of the solar spectrum in the ultra-violet is readily accounted for by the absorptive action of atmospheric ozone, without taking into account the possible absorptive power of nitrogen and oxygen. The blue tint of the atmosphere is probably due to ozone. It is shown in the paper that the wave-length of the extreme ray capable of absorption by considerable quantities of ozone is about 316. A quantity of 2·5 mgm. of ozone in each square centimetre of sectional area of a column of air produces, it is said, a full sky-blue tint. Incidentally experiments are described in which one volume of ozone was distinctly detected by the sense of smell in 2,500,000 volumes of air.

MR. G. S. JOHNSON has obtained ammonia (*Chem. Soc. Journal*) by passing hydrogen and (presumably) pure nitrogen over cold or moderately heated spongy platinum: when however the mixed gases were passed over hot asbestos before traversing the spongy platinum, *no* ammonia was formed. Mr. Johnson thinks that nitrogen probably exists in two forms, an active and an inactive form, the latter being produced by the action of heat on the former.

DR. DUPRÉ has introduced (*Analyst*) a slight modification into the ordinary method for observing a colour change in titrating with standard solutions, which is said to render the perception of the change very sharp and accurate. He views the liquid to be titrated through a glass cell containing a solution of the same colour as, and about equal in intensity to, the liquid itself.